

REMARKS

Applicants request favorable reconsideration of this application in view of the foregoing amendments and the following remarks. Claims 6-29 were pending in the application and were rejected in the Office Action.

Applicants appreciate the indication of allowable subject matter in claims 9, 13-21, and 26. In response to this positive indication, Applicants have: (a) amended claims 9, 13, and 26 to be in independent claim format; (b) amended claim 14 (*i.e.*, the claim from which claims 15-21 depend) to resolve an indefiniteness issue, as later discussed in detail; (c) amended claim 23 to depend from allowable claim 26; and (d) added new dependent claims 30-38 (which respectively recite the same limitations as claims 11, 12, 7, 8, 10, 24, and 27-29 and which, therefore, do not present new matter or new issues) to depend from allowable claims 9, 13, and 26.

In addition, without presenting new matter or new issues, the limitations of claim 11 (which has been canceled herein) have been incorporated into claim 6. Correspondingly, claim 12, which previously depended from claim 11, has been amended to depend from claim 6. Further, previously independent claim 22 (*i.e.*, the claim from which claims 24, 25 and 27-29 continue to depend) has been amended to depend from claim 6.

Accordingly, without presenting new matter or new issues, claims 6-10 and 12-38 are respectfully presented for further consideration.

1. Teleconference with Examiner

Applicants appreciate the teleconference with the Examiner on August 23, 2005. During the teleconference, the Examiner acknowledged that the rejection of claims “13-21” under 35 U.S.C. § 112, ¶ 2 (which is later discussed in detail) in Office Action ¶ 8 should have been a rejection of claims “14-21.” Correspondingly, the rejection of claims “11-12, 18-19, and 28-29” under 35 U.S.C. § 112, ¶ 2 in Office Action ¶ 9 should have been a rejection of claims “11-13, 18-19, and 28-29.” Finally, in the listing of allowable subject matter, claim 13 should have been listed in Office Action ¶ 17 along with claims 9 and 26 (as claims that contain allowable subject matter but were rejected as being dependent on rejected base claims) rather than in Office Action ¶ 16 along with claims 14-21.

2. Listing of References Considered

Applicants appreciate the Examiner-initialed copy of the PTO/SB/08 that was submitted along with the Information Disclosure Statement that was filed on June 4, 2004. In

reviewing the listing of Examiner-cited references, Applicants note that U.S. Patent No. 5,600,634 (“Satoh”), which was cited in the Final Office Action against claims 11, 12, and 23 was not listed. Accordingly, Applicants are concerned that one or more other references may have been considered but inadvertently omitted and, therefore, Applicants respectfully request that the Examiner recheck the listing of cited references.

3. Rejections of Claim 11-21, 28, and 29 under 35 U.S.C. § 112, ¶ 2

a. Rejection of Claims 14-21

The Examiner rejected claims 14-21¹ under 35 U.S.C. § 112, ¶ 2 as allegedly being indefinite based on a lack of a cooperative structural relationship between the radio and the drive control circuit recited in claim 14 (*i.e.*, the claim from which claims 15-21 depend). By way of the amendments made herein, claim 14 has been amended to recite that the “drive control circuit is communicatively connected to a radio”.² Support for this recitation is implicitly provided in the two portions of the specification, which one of ordinary skill in the art would understand as being either an electrically wired connection or a wireless connection. *See* p. 3, lines 4-6; p. 12, lines 10-12. Accordingly, in light of this amendment to claim 14, Applicants respectfully submit that this rejection is now moot and, therefore, a withdrawal of this rejection under § 112, ¶ 2 is both warranted and earnestly solicited.

b. Rejection of Claims 11-13, 18, 19, 28, and 29

The Examiner rejected claims 11-13, 18, 19, 28, and 29³ under 35 U.S.C. § 112, ¶ 2 as allegedly being indefinite due to a recitation of a “first predetermined rate” in claims 11, 18, and 28 and a “second predetermined rate” in claims 12, 19, and 29. Preliminarily, Applicants respectfully note that claims 28 and 29 merely recite the “predetermined rate” (without any mention of “first” or “second”) that is recited in claim 22 (*i.e.*, the claim from which claims 28 and 29 depend). Accordingly, Applicants are uncertain as to whether the Examiner intended to include claims 28 and 29 in this rejection.

Regardless, the Examiner acknowledges that the specification teaches that the duty ratio of the PWM signal is increased/decreased at a rate of 8% per second. The 8% increase supports the recitation of the “first predetermined rate” recited in claims 11 and 18 and the

¹ Although the stated rejection listed claims 13-21, the Examiner acknowledged, as previously discussed, that this rejection should have been to claims 14-21.

² A similar amendment has been made to claims 9 and 26, which, like claim 14, recite the radio and the drive control circuit.

³ Although the stated rejection listed claims 11, 12, 18, 19, 28, and 29, the Examiner acknowledged, as previously discussed, that this rejection should have been to claims 11-13, 18, 19, 28, and 29.

8% decrease supports the “second predetermined rate” recited in claims 12 and 19. Similarly, the 8% increase/decrease supports the “predetermined rate” recited in claim 22.

In light of the foregoing, as the first predetermine rates of claims 11, 18, as the second predetermine rates of 12, and 19, and as the predetermined rate of claim 22 (*i.e.*, the claim from which claims 28 and 29 depend) are fully supported by the 8% increase/decrease recited in the specification, the claims are sufficiently definite. Accordingly, a withdrawal of this rejection under § 112, ¶ 2 is both warranted and earnestly solicited.

4. Rejections of Claims 6-8, 10-12, 22-25, and 27-29 under 35 U.S.C. § 103(a)

Under 35 U.S.C. § 103(a), the Examiner rejected:

- (a) claims 6 and 7 as allegedly being obvious when considering U.S. Patent No. 6,288,508 (“Taketomi”) in view of Satoh;
- (b) claims 8 and 10 as allegedly being obvious when considering Taketomi in view of Satoh and further in view of U.S. Patent No. 6,124,688 (“Coles”);
- (c) claims 11, 12, and 23 as allegedly being obvious when considering Taketomi in view of Satoh and further in view of U.S. Patent No. 6,208,102 (“Kikuchi”);
- (d) claims 22, 24, 28, and 29 as allegedly being obvious when considering Taketomi in view of Kikuchi; and
- (e) claims 25 and 27 as allegedly being obvious when considering Taketomi in view of Kikuchi and further in view of Coles.

For the following reasons, Applicants respectfully traverse each of these rejections.

Preliminarily, as claim 23 has been amended to depend from allowable claim 26, the aforementioned rejection of claim 23 is now moot. Similarly, as claim 11 has been incorporated into claim 6, the aforementioned rejection of claim 11 will be addressed in conjunction with claim 6. In addition, as previously independent claim 22 (*i.e.*, the claim from which claims 24, 25 and 27-29 depend) has been amended to depend from independent claim 6, the following Remarks, which are to have no impact on the patentability and scope of protection to be afforded to allowable claims 9, 13-21, 23, 26, and 30-38, will be addressed with respect to claim 6, while taking into consideration the references applied to claims 7, 8, 10-12, 22, 24, 25 and 27-29.

As amended herein, independent claim 6 (*i.e.*, the claim from which claims 7, 8, 10, 12, 22, 24, 25, and 27-29 depend) recites a driving control device for an actuator. The driving control device includes, among other possible things (*italic emphasis added*):

a drive circuit configured to drive an electric motor of an actuator for opening and closing *an air conditioning door*; and
a drive control circuit configured to control a rotation of said electric motor by controlling the drive circuit,

wherein said drive circuit includes an H bridge circuit having a switching semiconductor element,

wherein said drive circuit is configured to rotate said electric motor in forward and reverse directions by turning on and/or off said switching semiconductor element,

wherein said drive control circuit is configured to start and/or stop said electric motor by applying a PWM signal to the switching semiconductor element constructing a lower arm of said H bridge circuit, and

wherein, when starting the electric motor, said drive control circuit is configured to apply the PWM signal to the switching semiconductor element constructing the lower arm of said H bridge circuit such that a duty ratio of the PWM signal increases based on a first predetermined rate.

For the following reasons Taketomi, Satoh, Coles, and Kikuchi can not be properly combined under 35 U.S.C. § 103(a) to reject claim 6, or any claim dependent thereon.

As above-italicized, claim 6 addresses a driving control device that includes “a drive circuit configured to drive an electric motor of an actuator for opening and closing *an air conditioning door*.” Accordingly, under M.P.E.P. § 2141.01(a) for a reference to be applicable to the invention recited in claim 6, “the reference must either be in the field of applicant’s endeavor or, if not, then be reasonably pertinent to the particular problem with which the inventor was concerned.” With respect to claims 6-8, 10, 12, 22, 24, 25, and 27-29 and without regard to claims 9, 13-21, 23, 26, and 30-38, the “field of applicant’s endeavor” is clearly an air conditioning device. Only one of the cited references (Satoh) even mentions air conditioning. Perhaps this is why the Examiner discusses Satoh before Taketomi, in the rejection of claim 6, even though Taketomi is listed as the base reference.

As Satoh is the only cited reference that addresses air condition, it makes sense that the Examiner would apply it as the base reference when rejecting claim 6. However, as the Examiner acknowledges: “Although Satoh et al teaches about a motor that is used for an air conditioning door, the disclosure does not fully show how the motor control would have been implemented in the same manner as in this application.” In other words, Applicants understand the Examiner’s statement to mean that although Satoh teaches a motor controlled air conditioning door, it fails to teach or suggest any of the other limitations of claim 6.

In light of this understanding of Satoh, the inquiry becomes: would one of ordinary skill in the art, in light of Satoh's failure to teach or suggest any of the other limitations of claim 6, turn to any one or more of the arts of automotive braking (Taketomi), automotive sliding doors (Kikuchi), or power steering (Coles)? More specifically are any of Taketomi, Kikuchi, and/or Coles "reasonably pertinent to the particular problem with which the inventor was concerned"? With respect to claim 6, the problem with which the inventor was concerned was reducing the noise generated by gear backlash when the motor is actuated (or is stopped), which causes the MOS transistors, Tr1 to Tr4, of a conventional H-bridge circuit to be rapidly turned-on (or turned-off). *See* Application at p. 2.

Although Taketomi also uses an H-bridge circuit and a motor control pulse width modulation circuit (PWM) 33, Taketomi does not teach or suggest that the PWM signals are used to reduce noise. Rather, Taketomi's stated purpose of the PWM signals is "to provide the amount of speed required as demanded by the operator due to the position of the accelerator switch S2 and the associated potentiometer 17." *See* col. 3, lines 16-28. Accordingly, one of ordinary skill in the art, when considering Satoh's failure to teach or suggest any of the other limitations of claim 6, would not turn to Taketomi. In other words, Taketomi is not "reasonably pertinent to the particular problem with which the inventor was concerned" and, therefore, Taketomi is inapplicable under 35 U.S.C. § 103(a). *See* M.P.E.P. § 2141.01(a).

Similar to Taketomi, although Kikuchi teaches an H-bridge circuit (Fig. 14) and PWM control signals, the PWM control signals are used to control the door speed of a sliding door. *See, e.g.*, col. 6, lines 38-44. More specifically, Kikuchi is silent as to reducing noise. Therefore, one of ordinary skill in the art, when considering Satoh's failure to teach or suggest any of the other limitations of claim 6, would not turn to Kikuchi. Accordingly, like Taketomi, Kikuchi is not "reasonably pertinent to the particular problem with which the inventor was concerned" and, therefore, Kikuchi also inapplicable under 35 U.S.C. § 103(a). *See* M.P.E.P. § 2141.01(a).

Finally, with respect to Coles, the inquiry is more complex. First, Applicants acknowledge that one of Coles' aims was to minimize "acoustic noise from the motor." *See, e.g.*, col. 2, lines 4-5; col. 4, lines 10-13. Moreover, to reduce such noise, Coles teaches applying a PWM signal to the bottom half of a multi-phase bridge. Further, Coles teaches reducing the PWM period over a predetermined number of PWM duty cycles (*i.e.*, Coles arguably teaches decreasing the duty ratio of the PWM signal at a predetermined rate). *See, e.g.*, col. 10, lines 16-63. In this regard, Coles arguably is "reasonably pertinent to the

particular problem with which the inventor was concerned.” However, Coles fails to cure all of the deficiencies of Satoh. Specifically, Coles fails to teach or suggest that, “when starting the electric motor, said drive control circuit is configured to apply the PWM signal to the switching semiconductor element constructing the lower arm of said H bridge circuit such that a duty ratio of the PWM signal increases based on a first predetermined rate,” as above-italicized in claim 6.

In light of the foregoing, as Taketomi and Kikuchi are inapplicable and as Coles fails to cure all of the deficiencies of Satoh, the references can not be used to reject claim 6, or any claim dependent thereon, under 35 U.S.C. § 103(a). Moreover, as claims 7, 8, 10, 12, 22-25 and 27-29 depend from claim 6, each of these references is also allowable over these references, without regard to the other patentable limitations recited therein. Accordingly, a withdrawal of the various rejections of claims 6-8, 10, 12, 22, 24, 25, and 27-29 under § 103(a) is both warranted and earnestly solicited.

CONCLUSION

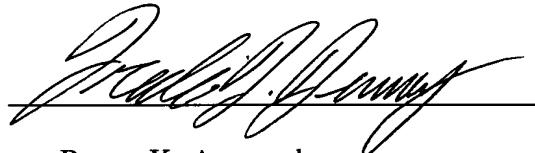
For the aforementioned reasons, claims 6-10 and 12-38 are now in condition for allowance. A Notice of Allowance at an early date is respectfully requested. The Examiner is invited to contact the undersigned if such communication would expedite the prosecution of the application.

Respectfully submitted,

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